

movement. KÜSTER believes that the usual movement of chromatophores is passive, these organs being carried in the direction of protoplasmic streaming, whatever the direction taken by the pseudopodia. From these studies it is concluded that the chromatophores in question are fluid. It is suggested that other chromatophores, as those in *Listera* and *Iris*, may have the characteristics of the *Orchis* chromatophore.—H. C. COWLES.

Parthenogenesis in Nicotiana.—GOODSPEED¹⁷ has made some very interesting experiments in connection with parthenogenesis in *Nicotiana*, suggested by a strain of *N. Tabacum* in which Mrs. R. H. THOMAS reports parthenogenesis. Over 500 attempts to produce parthenogenetic seed from a number of species and varieties of *Nicotiana* yielded negative results. These experiments included crossing and propagation through several generations. In the case of the parthenogenetic strain referred to, however, approximately 800 experiments resulted in over 100 normally matured fruits. In the majority of these parthenogenetic fruits empty seeds were produced in great numbers, and for this type of seed production, either with or without pollination, GOODSPEED suggests the term "phenospermy," referring to the seed condition usually described as "abortive" or "empty." Approximately 50 seeds occurred in nine of the parthenogenetic fruits, some of which showed mature endosperm and embryos. A small proportion of the seed from the parthenocarpic fruits was neither parthenogenetic nor phenospermic, but contained traces of endosperm only.—J. M. C.

Bactericidal substances.—That the juices of plants may contain bactericidal substances which figure in protecting the plants against the attacks of certain organisms has been shown by WAGNER.¹⁸ Varying numbers of bacteria of the non-parasitic species *Bacillus vulgatus*, *B. asterosporus*, and *Bacterium putridum* were injected into the tissues of potato tubers, beet roots, and the leaves and roots of *Sempervivum Hausmannii*. The injected organisms proved parasitic only when present in enormous numbers (3000–8000), and in that case were able to bring about the decay of the injected tissues. When injected in smaller numbers, the bacteria are destroyed. In case of the potato and of *Sempervivum*, the freshly expressed juice was found to possess bacteriolytic and agglutinating properties, but from the sugar beet no bactericidal juice could be obtained. The active substances were found to be contained in the protein fraction of the juice. When the fresh filtered juice containing enzymes, carbohydrates, and salts is allowed to stand for two days, its bactericidal power is destroyed, probably by the action of oxidases and other enzymes.—H. HASSELBRING.

¹⁷ GOODSPEED, THOMAS H., Parthenogenesis, parthenocarpy, and phenospermy in *Nicotiana*. Univ. Calif. Pub. Bot. 5:249–272. pl. 35. 1915.

¹⁸ WAGNER, R. J., Über bakterizide Stoffe in gesunden u. kranken Pflanzen. I. Mitteilung: Die gesunde Pflanze. Centralb. Bakt. II. 42:613–624. 1914.